

CLARKE et al
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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-18 (cancelled).

19 (currently amended). An integrated process for the production of an alkenyl carboxylate which process comprises the steps of:

(a) contacting in an oxidation reaction zone a C_2 to C_4 alkane, a molecular oxygen-containing gas, optionally the corresponding alkene and optionally water, in the presence of at least one catalyst active for the oxidation of the alkane to the corresponding alkene and carboxylic acid, to produce a first product stream comprising alkene, carboxylic acid and water;

(b) separating at least a portion of the product stream from step (a) into a fraction comprising the alkene and a fraction comprising the carboxylic acid and water;

(c) contacting in a second reaction zone at least a portion of said alkene fraction produced in step (b), a carboxylic acid and a molecular oxygen-containing gas, in the presence of at least one catalyst active for the production of alkenyl carboxylate to produce a second product stream comprising alkenyl carboxylate, water and carboxylic acid;

(d) feeding the carboxylic acid and water fraction produced in step (b) and the product stream comprising alkenyl carboxylate, water and carboxylic acid from step (c) to a single distillation means;

(d) ~~(e)~~ separating at least a portion of the product stream from step (c) and at

CLARKE et al
Appl. No. 10/500,305
September 4, 2007

least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation in a said single distillation means into an overhead fraction comprising alkenyl carboxylate and a base fraction comprising carboxylic acid;

(e) (f) recovering the alkenyl carboxylate from the overhead fraction separated in step (d)..

20 (currently amended). A process according to claim 19 wherein the at least a portion of the product stream from the second reaction zone is introduced separately from or as a single feed stream with the at least a portion of the carboxylic acid/water fraction obtained in step (b) to the distillation column.

21 (currently amended). A process according to claim 19 wherein at least a portion of the product stream from the oxidation reaction zone is co-joined with at least a portion of the product stream from the second reaction zone and the co-joined stream is fed into the distillation column.

22 (previously presented). A process according to claim 21 wherein the co-joined stream is fed as one or more streams into the distillation column.

23 (previously presented). A process according to claim 21 wherein at least a portion of the product stream from the oxidation reaction zone is fed to the distillation column separately from the product stream from the second reaction zone.

CLARKE et al
Appl. No. 10/500,305
September 4, 2007

24 (previously presented). A process according to claim 22 wherein at least a portion of the product stream from the oxidation reaction zone is fed to the distillation column separately from the product stream from the second reaction zone.

25 (previously presented). A process according to claim 23 wherein the product stream from the oxidation reaction zone is fed as one or more streams to the distillation column.

26 (previously presented). A process according to claim 24 wherein the product stream from the oxidation reaction zone is fed as one or more streams to the distillation column.

27 (previously presented). A process according to claim 23 wherein the product stream from the second reaction zone is fed as one or more streams to the distillation column.

28 (previously presented). A process according to claim 24 wherein the product stream from the second reaction zone is fed as one or more streams to the distillation column.

29 (previously presented). A process according to claim 25 wherein the product stream from the second reaction zone is fed as one or more streams to the distillation column.

CLARKE et al
Appl. No. 10/500,305
September 4, 2007

30 (previously presented). A process according to claim 26 wherein the product stream from the second reaction zone is fed as one or more streams to the distillation column.

31 (previously presented). A process according to claim 19 wherein the alkenyl carboxylate is vinyl acetate, the C₂ to C₄ alkane is ethane, the product stream from the oxidation reaction zone comprises ethylene, acetic acid and water, the carboxylic acid fed to the second reaction zone is acetic acid and the product stream from the second reaction zone comprises vinyl acetate, acetic acid and water.

32 (previously presented). A process according to claim 31 wherein ethylene and water are fed to the oxidation reaction zone.

33 (previously presented). A process according to claim 19 wherein the alkene fraction from the separation stage (b) is fed to the second reaction zone together with additional alkene.

34 (previously presented). A process according to claim 33 wherein the additional alkene is ethylene.

35 (previously presented). A process according to claim 19 wherein the weight ratio of water: carboxylic acid in the carboxylic acid/water fraction obtained in step (b) is

CLARKE et al
Appl. No. 10/500,305
September 4, 2007

in the range from 10 : 1 to 0.5 : 1.

36 (previously presented). A process according to claim 19 wherein the carboxylic acid fed to the second reaction zone has a water content, such that the amount of water entering the second reaction zone comprises less than 6 % by weight of the total carboxylic acid and water entering the second reaction zone.

37 (previously presented). A process according to claim 19 wherein the catalyst in the oxidation reaction zone is supported or unsupported.

38 (previously presented). A process according to claim 19 wherein the catalyst in the oxidation reaction zone is used in the form of a fixed bed or a fluidized bed.

39 (previously presented). A process according to claim 19 wherein the concentration of alkene fed to the oxidation reaction zone is from 0 and up to and including 50 mol% of the total feed, including recycles.

40 (currently amended). A process according to claim 19 wherein the concentration of water fed to the oxidation reaction zone is from 0 and up to and including 50 mol% of the total feed, including recycles.

41 (previously presented). A process according to claim 19 wherein the product stream from the second reaction zone is separated in one or more stages into a

CLARKE et al
Appl. No. 10/500,305
September 4, 2007

gaseous fraction comprising unreacted alkene and a liquid fraction comprising alkenyl
carboxylate, carboxylic acid and water.